Abstract

Let $p > 5$ be a prime number and let $U = \sum_{k=2}^{p-1} \frac{(-1)^k F_{k-1}}{k}$, $V = \sum_{k=2}^{p} \frac{(-1)^k F_k}{k-1}$. The aim of this paper is to prove that $U \equiv 0 \pmod{p^2}$, $V \equiv \frac{L_p - 1}{p} \pmod{p^2}$ if $p \equiv 1, 4 \pmod 5$ and $U \equiv \frac{1 - L_p}{p} \pmod{p^2}$, $V \equiv 0 \pmod{p^2}$ in the case $p \equiv 2, 3 \pmod 5$. We also find similar results for some general Lucas sequences.